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Patent No. : 7,201,992
Application No. : 10/750,609
Issue Date : April 10, 2007
Inventor(s) : Yang et al.

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P.O. Box 1450
Alexandria, VA 22313-1450

REQUEST FOR CERTIFICATE OF CORRECTION

Commissioner:

The owner of the above referenced U.S. Patent No. 7,201,992, respectfully requests that the attached "CERTIFICATE OF CORRECTION" be granted. On or about April 10, 2006, then Applicants amended claim 1 of the Patent as shown in the attached EXHIBIT A which is a copy from the U.S. Patent & Trademark Office PAIR web-site of pages 2 through 8 ("Amendment to the Claims") of a March 1, 2006, Amendment filed by the undersigned. On pages 2-3 of the Amendment, it is shown that claim 1 was amended by adding subsection "d". Within the amended language it is stated: "so that the first reactant flowing from the first reactant inlet (90) to the first reactant outlet (92) passes through the common turn-around (96) and mixes within the common turn-around (96)…."

Unfortunately, however the transcription of that amendatory language into claim 1 of the above sited U.S. Patent reads as follows: "so that the first reactant flowing from the first reactant inlet (90) to the first reactant outlet (92) passes through the common turn-around (96) and raises within the common turn around (96)…." The word "raises" in claim 1 of U.S. Patent

7,201,992 at col. 6, line 64 should have read "mixes".

For further support that the word "mixes" is the appropriate word and that the transcription error was caused by the U.S. Patent & Trademark Office, attention is drawn to the correct transcription of amended Claim 7 as amended by the March 1, 2006 Office Action. Amended Claim 7 also added a subparagraph reciting the structure that provides for the mixing of the fluids. At col. 8, line 10, the word "mixing" is properly used within claim 7 of issued U.S. Patent 7,201,992. (See Exhibit A, at page 5.)

Also attached hereto as EXHIBIT B is a copy from the U.S. Patent And Trademark Office PAIR web-site of pages 2 - 3 of a subsequent October 5, 2006 Amendment filed by the undersigned indicating that Claim 1 was not further amended, and showing proper usage of the word "mixes" at line 26 of the claim instead of the word "raises". Therefore, "raises" must have been inadvertently inserted by typographical error by the U.S. Patent & Trademark Office.

Consequently, it is urged that the error giving rise to the improper use of the word "raises" in claim 1 as described above resulted from an apparent typographical error by the U.S. Patent and Trademark Office. Consequently, it is respectfully urged that the attached CERTIFICATE OF CORRECTION be issued.

Respectfully submitted,
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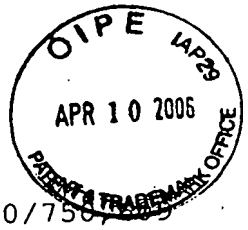
Date: 5/22/2007

Exhibit A



Amendment to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

Claim 1 (currently amended): A fuel cell (12) for generating electrical current from first and second reactant streams, comprising:

a. a membrane electrode assembly (46);

b. a first reactant flow field (80) secured adjacent a surface selected from the group consisting of a first surface (48) and a second surface (50) of the membrane electrode assembly (46) for directing flow of a first reactant adjacent the selected surface (48, 50) of the assembly (46); ~~and,~~

c. wherein the first reactant flow field (80) defines a plurality of two-pass circuits (82, 84, 86, 88), each two-pass circuit being in fluid communication with a first reactant inlet (90) for directing the first reactant into the fuel cell (12), and in fluid communication with a first reactant outlet (92) for directing the first reactant out of the fuel cell (12); and,

d. wherein the reactant flow field (80) defines a common turn-around (96) in fluid communication with each two-pass circuit (82, 84, 86, 88), and the common turn-around (96) being defined between the first reactant inlet (90) and the first reactant outlet (92) so that

the first reactant flowing from the first reactant inlet (90) to the first reactant outlet (92) passes through the common turn-around (96) and mixes within the common turn around (96) with the first reactant passing through the other of the plurality of two-pass circuits (84, 86, 88).

Claim 2 (original) The fuel cell (12) of claim 1, wherein each two-pass circuit (82, 84, 86, 88) defines a width across the two-pass circuit (82), when divided by a cross-flow length (114) of the first reactant flow field, that is greater than 0.1 and less than 0.5, wherein the width across each two-pass circuit (82) is a shortest distance across the two-pass circuit (82) in a direction perpendicular to flow of the first reactant through the two-pass circuit (82), and the cross-flow length (114) of the first reactant flow field (80) is a shortest distance across the first reactant flow field (80) in a direction perpendicular to flow of the first reactant through the flow field (80).

Claim 3 (original) The fuel cell (12) of claim 1, wherein the first reactant flow field (80) is a cathode flow field (20) for directing flow of an oxygen containing oxidant reactant adjacent the selected surface (48) of the membrane electrode assembly.

Claim 4 (original) The fuel cell (12) of claim 1, wherein the first reactant flow field (80) is an anode flow field (28) for directing flow of a hydrogen containing reducing fluid

adjacent the selected surface (50) of the membrane electrode assembly.

Claim 5 (currently amended) The fuel cell (12) of claim 1, further comprising a second reactant flow field (28) secured adjacent the ~~non-selected~~ first or second surface (48, 50) for directing flow of a second reactant adjacent the ~~non-selected~~ first or second surface (48, 50), wherein the second reactant flow field (28) defines a plurality of two-pass circuits (82, 84, 86, 88), each two-pass circuit being in fluid communication with a reactant inlet (90) for directing the second reactant into the fuel cell (12), and in fluid communication with a reactant outlet (92) for directing the second reactant out of the fuel cell (12).

Claim 6 (original) The fuel cell (12) of claim 1, wherein the first reactant flow field (80) is a cathode flow field (20), the number of two-pass circuits (82, 84, 86, 88) in each reactant flow field is greater than or equal to 2 and less than 10, a width across a two-pass circuit (82) divided by a parallel-flow length of the two-pass circuit (82) is greater than 0.3 and less than 1.0, wherein the parallel-flow length of the two-pass circuit (82) is one-half of a shortest distance along the two-pass circuit (82) from a point of entry of the reactant stream into the circuit (82) to a point of exit of the reactant stream from the circuit (82) in a direction parallel to flow of the stream through the circuit (82).

Claim 7 (currently amended) A method of managing water within a fuel cell (12) comprising the steps of:

a. securing a first reactant flow field (80) within a fuel cell (12) adjacent a surface of a membrane electrode assembly (46) selected from the group consisting of a first surface (48) and a second surface (50) of the assembly (46); and,

b. directing a first reactant to flow through a plurality of two-pass circuits (82, 84, 86, 88) defined within the first reactant flow field (80); and,

c. directing the first reactant to flow from reactant inlets (90) of the two-pass circuits (82, 84, 86, 88) through a common turn-around (96) defined within the reactant flow field (80), then mixing the first reactants from the reactant inlets (90) within the common turn-around (96), and then directing the first reactant to flow from the common turn-around (96) through reactant outlets (92) of the two-pass circuits (82, 84, 86, 88).

Claim 8 (new) A fuel cell (12) for generating electrical current from first and second reactant streams, comprising:

a. a membrane electrode assembly (46);

b. a first reactant flow field (80) secured adjacent a surface selected from the group consisting of a first surface (48) and a second surface (50) of the membrane electrode assembly (46) for directing flow of a first

reactant adjacent the selected surface (48, 50) of the assembly (46); and,

c. wherein the first reactant flow field (80) defines a plurality of two-pass circuits (82, 84, 86, 88) defined within porous layers of the flow field (80), each two-pass circuit being in fluid communication with a first reactant inlet (90) for directing the first reactant into the fuel cell (12), and in fluid communication with a first reactant outlet (92) for directing the first reactant out of the fuel cell (12).

Claim 9 (new) The fuel cell (12) of claim 8, wherein each two-pass circuit (82, 84, 86, 88) defines a width across the two-pass circuit (82), when divided by a cross-flow length (114) of the first reactant flow field, that is greater than 0.1 and less than 0.5, wherein the width across each two-pass circuit (82) is a shortest distance across the two-pass circuit (82) in a direction perpendicular to flow of the first reactant through the two-pass circuit (82), and the cross-flow length (114) of the first reactant flow field (80) is a shortest distance across the first reactant flow field (80) in a direction perpendicular to flow of the first reactant through the flow field (80).

Claim 10 (new) The fuel cell (12) of claim 8, wherein the first reactant flow field (80) is a cathode flow field (20) for directing flow of an oxygen containing oxidant reactant adjacent the selected surface (48) of the membrane electrode assembly.

Claim 11 (new) The fuel cell (12) of claim 8, wherein the first reactant flow field (80) is an anode flow field (28) for directing flow of a hydrogen containing reducing fluid adjacent the selected surface (50) of the membrane electrode assembly.

Claim 12 (new) The fuel cell (12) of claim 8, further comprising a second reactant flow field (28) secured adjacent the first or second surface (48, 50) for directing flow of a second reactant adjacent the first or second surface (48, 50), wherein the second reactant flow field (28) defines a plurality of two-pass circuits (82, 84, 86, 88), each two-pass circuit being in fluid communication with a reactant inlet (90) for directing the second reactant into the fuel cell (12), and in fluid communication with a reactant outlet (92) for directing the second reactant out of the fuel cell (12)

Claim 13 (new) The fuel cell (12) of claim 8, wherein the first reactant flow field (80) is a cathode flow field (20), the number of two-pass circuits (82, 84, 86, 88) in each reactant flow field is greater than or equal to 2 and less than 10, a width across a two-pass circuit (82) divided by a parallel-flow length of the two-pass circuit (82) is greater than 0.3 and less than 1.0, wherein the parallel-flow length of the two-pass circuit (82) is one-half of a shortest distance along the two-pass circuit (82) from a point of entry of the reactant stream into the circuit (82) to a point of exit of the reactant stream from

the circuit (82) in a direction parallel to flow of the stream through the circuit (82).

Claim 14 (new) The fuel cell (12) of claim 8, wherein the first reactant flow field (80) defines a common turn-around (96) in fluid communication with each two-pass circuit (82, 84, 86, 88), and the common turn-around (96) being defined between the first reactant inlet (90) and the first reactant outlet (92) so that the first reactant flowing from the first reactant inlet (90) to the first reactant outlet (92) passes through the common turn-around (96) and mixes within the common turn around (96) with the first reactant passing through the other of the plurality of two-pass circuits (84, 86, 88).

Exhibit B

Amendment to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

Please cancel claims 9 - 14.

Listing of Claims:

Claim 1 (previously presented): A fuel cell (12) for generating electrical current from first and second reactant streams, comprising:

a. a membrane electrode assembly (46);

b. a first reactant flow field (80) secured adjacent a surface selected from the group consisting of a first surface (48) and a second surface (50) of the membrane electrode assembly (46) for directing flow of a first reactant adjacent the selected surface (48, 50) of the assembly (46);

c. wherein the first reactant flow field (80) defines a plurality of two-pass circuits (82, 84, 86, 88), each two-pass circuit being in fluid communication with a first reactant inlet (90) for directing the first reactant into the fuel cell (12), and in fluid communication with a first reactant outlet (92) for directing the first reactant out of the fuel cell (12); and,

d. wherein the reactant flow field (80) defines a common turn-around (96) in fluid communication with each two-pass circuit (82, 84, 86, 88), and the common turn-

around (96) being defined between the first reactant inlet (90) and the first reactant outlet (92) so that the first reactant flowing from the first reactant inlet (90) to the first reactant outlet (92) passes through the common turn-around (96) and mixes within the common turn around (96) with the first reactant passing through the other of the plurality of two-pass circuits (84, 86, 88).

Claim 2 (original) The fuel cell (12) of claim 1, wherein each two-pass circuit (82, 84, 86, 88) defines a width across the two-pass circuit (82), when divided by a cross-flow length (114) of the first reactant flow field, that is greater than 0.1 and less than 0.5, wherein the width across each two-pass circuit (82) is a shortest distance across the two-pass circuit (82) in a direction perpendicular to flow of the first reactant through the two-pass circuit (82), and the cross-flow length (114) of the first reactant flow field (80) is a shortest distance across the first reactant flow field (80) in a direction perpendicular to flow of the first reactant through the flow field (80).

Claim 3 (original) The fuel cell (12) of claim 1, wherein the first reactant flow field (80) is a cathode flow field (20) for directing flow of an oxygen containing oxidant reactant adjacent the selected surface (48) of the membrane electrode assembly.

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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

(Also Form PTO-1050)

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 7,201,992

APPLICATION NO.: 10/750,609

ISSUE DATE : April 10, 2007

INVENTOR(S) : Yang et al.

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 6, line 64, the word "raises" should be deleted and replaced with --mixes--.

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